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Telephone Engineering Newsletter

Newsletters are intended to provide a means of answering questions that arise in the field and to advise the field of new developments. They are not intended to be instructions nor to replace in any respect the presently-approved channels for establishing requirements and procedures. Suggestions for subjects will be gladly received.

TE and CM Sections, New, Revised and Addenda Issued

Several new and revised sections and addenda to sections of the Telephone Engineering and Construction Manual have been distributed. These are:

Addendum 1 to Section 310, Heating, Ventilating and Humidity Control.
Revision, Section 415, Transmission Requirements.
New, Section 455, Inductive Coordination, Isolating Factors Contributing to Noise on Subscriber Lines.
New, Section 605, Right-of-Way Assembly Units.
Addendum 1 to Section 615, Design of Open Wire Plant.
Revision, Section 625, Open Wire Pole Top Assembly Units.
Addendum 2 to Section 635, Construction of Aerial Cable Plant.
Addendum 1 to Section 661, Exchange Line Transpositions.
Addendum 2 to Section 701, Station Installations.
Revision, Section 801, Conditions Requiring Electrical Protection.

New Recommendations on Transpositions

The addendum to Section 615, "Design of Open Wire Plant," recommends the use of point type transpositions, using the R-2 transposition system for use in windy areas of the country on spans in excess of 250 feet. This is to minimize trouble from mid-span hits in bare wire plant. Point type brackets are available with 12 inch wire spacing for type A crossarms and with 10 inch spacing for type B crossarms. These brackets are to be used on pin pairs 1/2, 3/4, 7/8 and 9/10. Pole pairs are to be transposed using two heavy duty tandem brackets mounted side by side on both types of crossarms. The wide pin spacing gives sufficient average wire separation on pole pairs to permit this type of transposition. All transpositions are to be left over right thus reducing the types of brackets required.

New Types of Drop Wire for Long Spans

Experimental installations are being made in different places of new types of wire which comprise two conductors under one coating of

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polyethylene. One type will use .064 inch diameter, or .080 inch 30 percent EHS Copperweld wire for each conductor. Other types will use .083 inch diameter, 135 or 190 grade galvanized steel wire for each conductor. These wires appear to be satisfactory for spans considerably longer than ordinary drop wire. The attenuation of the .064 inch, 30 percent Copperweld is such that it can be used for subscriber lines at voice frequencies with no cable or loading for about five miles. Data for the steel wire is not yet available but will be somewhat less than for the Copperweld wire. These types of wire will fill a need in the REA telephone program, particularly single circuit runs where heavy tree clearing is involved, for drops where cable is on long span construction, for drops across highways where ordinary drop wire sag is too great, and for subscriber loops up side roads from a main open wire or cable line. Trial installations of this type of wire are desired.

Symposium for Consulting Engineers

A symposium as scheduled with consulting engineers at Lincoln, Nebraska, was held the week beginning Monday, December 12, 1955. The program covered many of the phases of telephony and the REA telephone program as is usual at such meetings.

Trial Installation of Self-Supporting Cable

The Union Point Telephone Company, Union Point, Georgia (Georgia 544), erected about 15,000 feet of 26 pair, 19 gauge Copperweld self-supporting cable early in May 1955. No reports of any difficulty have been received since then relating to this cable. It was erected without particular difficulty by the contractor. The 19 gauge Copperweld conductors are equivalent to 22 gauge copper conductors. Although the cost of this installation is higher than for plastic strand supported cable, it is believed by observers that with more experience in its construction bid prices on self-supporting cable may be as low or lower than for equivalent strand supported cable.

Method for Minimizing Drop Wire Dancing and Clamp Wear

TED No. 27, dated August 29, 1955, discussed a reinforcing eyelet for drop wire clamp bails to minimize wear on the bail wire. Bail wear as well as drop wire vibration and dancing can be reduced by transposing the drop wire. This can be accomplished by turning parallel type wires over once in each ten feet or rotating the wire one complete turn in each twenty feet at the time of installation. The wire will then present an irregular configuration to the wind which will reduce oscillation. If the wire has been installed and excessive dancing is experienced, the turns can be placed by removing the drop wire at the

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wire terminal and drive hook and turning the wire without removing the clamp from the wire. If the drop wire is supported at an intermediate point, the turns can be established by removing the wire from the support and turning both spans at the same time.

A New Plastic Ready Access Terminal, No. 49A

A new type of cable terminal has been developed by the Bell System which is available to REA borrowers. It is for plastic sheathed, plastic insulated cable only. It comprises a neoprene flexible housing with a metal frame supported by the cable. Six pair terminal blocks mount on the metal frame. These blocks have three pairs of terminals on each side, which means that the terminal can be used from both sides. Four of these blocks are provided for on the base plate making it a 24 pair terminal. Drop wires enter from the bottom through grommets. Metal snaps hold the neoprene jacket closed below the base plate. These unsnap to permit entry for attachment of drops. Rings below the case support the drop wires outside of the case. It is priced at about \$6.00 each. Although it is not completely watertight, this may not be objectionable with present methods for splicing plastic insulated cable. The case can be used at splices or to terminal pairs elsewhere than at splices. It is known as the No. 49A Ready Access Cable Terminal. It is available to REA borrowers through the Graybar Company. Locations are desired where it can be given field trial for which specific approval will be granted.

Trial Installation, Polyethylene Covered Steel Wire in Sea Coast Area

The erection of the polyethylene insulated .109 inch, 135 grade galvanized steel wire given to the borrower by the American Steel and Wire Company was completed early in November. The installation is in the plant of the Lafourche Telephone Company at Grand Isle, Louisiana, where steel wire cannot be used uninsulated because of salt spray in the atmosphere. Attachment to poles and connections between line wire and bridle wire are protected to prevent moisture attacking the steel wire. Deadends are made using Preformed Line Products Company's grips coated with polyvinyl, which are applied over the polyethylene of the line wire. Attachment to other poles is by double V-notch splints with polyvinyl covering, pretied to the insulators with the splint wrapped over the insulation of the line wire.

Line Insulation Tests as a Preventive Maintenance Effort

The insulation leakage resistance of cable and open wire plant must be measured subsequent to the completion of construction to make sure that

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the construction specifications have been met and that, from the standpoint of leakage, the circuits will be operable. After the outside plant has been placed in service, the insulation resistance of each circuit is probably the most important characteristic of the circuit. Generally speaking, its value, considering the relative make-up and length of the line, may be taken as an indication of the operating condition of the circuit.

A record of wet and dry weather insulation leakage resistance made shortly after the plant is placed into service, to be used as reference measurements, will be found very useful for comparison with future measurements made as one of the preventive maintenance efforts. Measurements may be made with a voltmeter and battery, ohmmeter, voltohmmeter, or other suitable instrument.

Leakage resistance to ground of the various lines may vary over a wide range because of the type of plant facilities in the circuit, length of the line, age of the plant, weather conditions when the measurements are made, and the condition of the circuit. However, an individual line measurement should not vary appreciably except when weather conditions change or when the condition of the line has changed. For this reason, it is important to get leakage resistance measurements when the circuit is in the best and the poorest condition as a means of recording the two extreme limits caused by weather conditions. Readings made and recorded in hot, dry weather and then made and recorded during damp, foggy weather will accomplish this. Then, unless there is a condition present which is likely to cause a service failure, subsequent readings should always be between these two reference measurements.

Successive line insulation measurements should be made at regular or irregular intervals, depending upon the maintenance approach being used, and should be made during damp weather, preferably at night or during the early morning hours when leakage across cable terminal lugs, line insulators, protective device, etc., is highest.

If the line insulation resistance of any circuit is lower than the reference wet weather measurement, or if a progressive decrease in line insulation resistance on successive test days is noticed, it is an indication of a nonstandard condition, or conditions, which will likely cause trouble. When such noncondition is found, efforts should be made to disclose the location and to make necessary repairs.

Pretied Splints

Prelashed splints also called "pretied" splints will be available soon. These splints will be made of .134 inch diameter steel with

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Grade C galvanizing for .109 inch diameter line wire. They are designed to be lashed or tied to the insulators by .095 inch diameter galvanized steel tie wire as shown in a guide drawing 163-3, copy of which is attached. They permit unwinding from line wire so that slack can be pulled after which they can be rewound onto the wire. They result in more uniformity of tie than provided by any other tie method. The splints can be lashed to the insulators as a rainy day or as a shop job. Similar splints for Copperweld line wire are expected to be developed in the near future. Their holding power is as great as with any other telephone line wire tie. Dampers are recommended in each span where they are used.

Washers (for Bolts)

Certain sizes of round and square washers called for in Form 511 are not shown in the "List of Materials Acceptable for Use on Telephone Systems of REA Borrowers." For purposes of standardization, two sizes only of round washers, namely 1" x 7/16" hole and 1-3/8" x 9/16" hole, will be required in a forthcoming revision of Form 511. Steps have been taken to request the submission of catalog numbers for these sizes of washers from the manufacturers, and these numbers will be included in a future supplement to the list of materials. In addition, Form 511 will be corrected by the deletion of square washer size 2 1/4" x 2 1/4" x 3/16", 1-3/16" hole and in its place the substitution of a washer measuring 2 1/4" x 2 1/4" x 3/16", 11/16" hole. Until these changes are issued, it will be satisfactory to use washers of the sizes called for in the present issue of Form 511.

